Section G

Air Quality

C-065350

Setting

The Brookside project lies within the San Joaquin Valley, which is bounded by the Diablo Range on the west and the Sierra Nevada on the east. The Carquinez Strait is a sea level gap between the Coast Ranges and the Diablo Range; the strait is 55 miles northwest of the study area, and the intervening terrain is flat.

Relationship to Air Quality Standards and Management Plans

The federal Clean Air Act established air quality standards for several pollutants and requires areas that violate these standards to prepare and implement plans to achieve the standards by certain deadlines. State and federal air quality standards are shown in Table G-1. These standards are divided into primary standards, which are designated to protect the public health, and secondary standards, which are intended to protect the public welfare from effects such as visibility reduction, soiling, nuisance, and other forms of damage.

Ozone. Ozone is a public health concern because it is a respiratory irritant that also increases susceptibility to respiratory infections. Ozone causes significant damage to leaf tissues of crops and natural vegetation and damages many materials by acting as a chemical oxidizing agent.

Carbon Monoxide. Carbon monoxide (CO) levels are a public health concern because CO combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Even relatively low concentrations of CO can significantly reduce the amount of oxygen in the bloodstream because CO binds to hemoglobin 220-245 times more strongly than does oxygen. Both the cardiovascular system and the central nervous system can be affected when 2.5-4.0 percent of the hemoglobin in the bloodstream is bound to CO rather than to oxygen. State and federal ambient air quality standards for CO have been set at levels intended to keep CO from combining with more than 1.5 percent of the blood's hemoglobin (U. S. Environmental Protection Agency 1979 and California Air Resources Board 1982).

Applicable Standards. Both the State of California and the federal government have established a variety of ambient air quality standards, including those for ozone and CO. The state 1-hour ozone standard is 0.10 ppm (parts per million, by volume), not to be equaled or exceeded. The federal 1-hour ozone standard is 0.12 ppm, not to be exceeded more than three times in any 3-year period.

Table G-1

Ambient Air Quality Standards Applicable In California

Pollutant	Symbol	Averaging Time	Standard, as ppm		Standard, as ug/m^3		Violation Criteria	
			California	National	California	National	California	National
Ozone	O3	1 hour	0.10	0.12	200	235	if equaled or exceeded	if exceeded on more than 3 days in 3 years
Carbon Monoxide	CO	8 hours	9.0	9	10,000	10,000	if exceeded	if exceeded on more than one day per year
		1 hour	20	35	23,000	40,000		
(Lake Tahoe only)		8 hours	6	---	7,000	---		
Nitrogen Dioxide	NO2	annual average	---	0.05	---	100	if equaled or exceeded	if exceeded
		1 hour	0.25	---	470	---		
Sulfur Dioxide	SO2	annual average	---	0.03	---	80	if exceeded	if exceeded
		24 hours	0.05	0.14	131	365		if exceeded on more than one day per year
		1 hour	0.25	---	655	---		
Hydrogen Sulfide	H2S	1 hour	0.03	---	42	---	if equaled or exceeded	
Vinyl Chloride	C2H3Cl	24 hours	0.010	---	26	---	if equaled or exceeded	
Particulate Matter, 10 microns or less	PM10	annual geometric mean	---	---	30	50	if exceeded	if exceeded
		24 hours	---	---	50	150		if exceeded on more than one day per year
Sulfate Particles	SO4	24 hours	---	---	25	---	if equaled or exceeded	
Lead Particles	Pb	calendar quarter	---	---	---	1.5	if equaled or exceeded	if exceeded on more than one day per year
		30 days	---	---	1.5	---		

Notes: ppm = parts per million by volume.
ug/m^3 = micrograms per cubic meter.
All standards are based on measurements at 25 degrees C and 1 atmosphere pressure.
National standards shown are the primary (health effects) standards.
The California 24-hour standard for SO2 applies only when state O3 or PM10 standards are being violated concurrently.
In November 1987 the California Air Resources Board adopted a new ozone standard of 0.09 ppm; regulations implementing this standard have not yet been approved by the Office of Administrative Law.

State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour CO standard is 20 ppm, while the federal 1-hour CO standard is 35 ppm. Both state and federal standards are 9 ppm for the 8-hour averaging period. State CO standards are phrased as values not to be exceeded. Federal CO standards are phrased as values not to be exceeded more than once per year. The deadline for attaining both the ozone and CO standards was December 31, 1987.

San Joaquin County Air Quality Management Plan. The San Joaquin County Air Quality Management Plan (AQMP), which is the current plan for achieving these standards, was prepared by the San Joaquin County Planning Department in 1982. San Joaquin County did not attain the air quality standards by the 1987 deadline, based on monitoring data for the last 3 years.

At present, San Joaquin County is not able to determine if the proposed project is consistent with the AQMP. The plan calls for the county planning department to set up a process for determining consistency. To date, this has not been done. (Keranan pers. comm.)

Although it is not possible to determine if the project is technically consistent with the AQMP, the project (and to a much larger degree projected cumulative development in the Stockton area) would generally make it more difficult to attain air quality standards. The addition of more dwelling units in the San Joaquin Valley air basin would lead to increased internal-external vehicle trips, compounding the existing ozone problem.

Air Quality Monitoring Data

Urban emission sources in the San Joaquin County area are a primary source of an existing air quality problem. The federal and state air quality standards for both ozone and CO are currently being exceeded (Table G-2).

As a consequence of the recorded violations of the federal ozone and CO standards, San Joaquin County has been designated a "nonattainment area" with respect to ozone and probably will be designated a "nonattainment area" with respect to CO once the most recent monitoring data become available.

The standards described above are primary air quality standards, i.e., those levels of air quality necessary to protect public health with an adequate margin of safety. The nonattainment designation indicates that, in San Joaquin County as a whole, the level of air quality for ozone and CO does not protect public health with an adequate margin of safety.

Ozone Concentrations

Methodology. Assessing the significance of regional ozone air quality impacts is more complicated than assessing the significance of localized CO impacts, which will be discussed in a following section. The difficulty in assessing the significance of ozone air quality impacts is due to several factors, including the following.

Table G-2

Summary of Air Quality Monitoring Data for San Joaquin County

Monitoring Station	Parameter	Carbon Monoxide									Ozone								
		1978	1979	1980	1981	1982	1983	1984	1985	1986	1978	1979	1980	1981	1982	1983	1984	1985	1986
Hazelton Street[a]	Peak-hour value[b]	17.0	18.0	18.0	14.1	16.0	17.0	9.0	12.0	17.0	0.08	0.14	0.14	0.14	0.12	0.15	0.14	0.12	0.12
	Peak 8-hour value[b]	11.3	10.5	13.1	7.5	8.6	9.7	5.3	6.3	9.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Days above standard[c]	1	2	1	0	0	1	0	0	1	0	1	1	4	0	4	2	0	0
Lodi-Ham Lane[d]	Peak-hour value[b]	17.0	17.0	10.0	9.0	12.0					0.15	0.14	0.14	0.13	0.13				
	Peak 8-hour value[b]	9.4	6.6	4.9	4.0	7.0					N/A	N/A	N/A	N/A	N/A				
	Days above standard[c]	1	0	0	0	0					13	5	6	1	1				
Union Island[e]	Peak-hour value[b]	2.0	4.0	2.0							0.16	0.13	0.10						
	Peak 8-hour value[b]	1.4	2.0	1.3							N/A	N/A	N/A						
	Days above standard[c]	0	0	0							21	3	0						
Stockton-4SE/CA Youth Center[f]	Peak-hour value[b]											0.15							
	Peak 8-hour value[b]											N/A							
	Days above standard[c]											7							
Ripon-Fire Station[f]	Peak-hour value[b]											0.14							
	Peak 8-hour value[b]											N/A							
	Days above standard[c]											4							
Mariposa[g]	Peak-hour value[b]															0.15	0.15	0.14	0.14
	Peak 8-hour value[b]															N/A	N/A	N/A	N/A
	Days above standard[c]															6	4	5	3
Claremont[h]	Peak-hour value[b]					18.0	16.0	16.0	13.0	19.0									
	Peak 8-hour value[b]					11.5	12.1	7.8	8.4	12.1									
	Days above standard[c]					2	2	0	0	9									

Source: California Air Resources Board 1979-1986.

N/A = Not applicable.

[a] No CO data reported for June-October 1978. No ozone data reported for June-December 1978, January-April 1979, October-December 1979, January-April 1980.

[b] Peak-hour and peak 8-hour values given as ppm.

[c] For ozone, days with a peak 1-hour value exceeding the federal primary standard of 0.12 ppm; for CO, days with a peak 8-hour average value exceeding the federal primary and state standards of 9 ppm.

[d] No CO data reported for January-November 1978, February-October 1979, April-October 1980, December 1980, January-February 1981, May-October 1981, May-September 1982. No ozone data reported for January-May 1978, October-December 1979, January-April 1980, November-December 1980, January-April 1981, November-December 1981, January-April 1982, October-December 1982.

[e] Station closed in June 1980.

[f] Special study monitoring. No ozone data reported for January-April 1979, October-December 1979.

[g] No ozone data reported for January-May 1983, November-December 1983, January-April 1984, November-December 1984, January-April 1985, November-December 1985, January-April 1986, November-December 1986.

[h] Special study monitoring. No CO data reported for January-November 1982, May-October 1983, March-October 1984, April-October 1985, March-October 1986.

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- Whereas CO impacts occur immediately and are localized in a small geographic area, ozone impacts can occur many hours after emissions are produced and are on a regional scale. The large amount of distance and time between production of emissions and formation of ozone allows many variables to affect the ultimate ozone concentrations. There is, therefore, a much less direct connection between the emission and the project-related impacts.

- Whereas CO emissions are relatively stable and have a direct impact, the ozone-producing photochemical process is complex and involves unstable compounds. Estimating changes in ozone concentrations due to a specific project would require sophisticated photochemical dispersion modeling. Operating these models is so expensive and time-consuming that estimating changes in ozone concentrations is generally beyond the cost and schedule constraints of project EIRs. Most EIRs, therefore, estimate changes in the amount of ozone precursor emissions rather than changes in ozone concentrations. Without estimates of ozone concentrations, direct comparisons with air quality standards, which are based on concentrations, are not possible.

As described above, ozone is the principal problem pollutant on a regional scale. Ozone is not emitted directly to the atmosphere but is the result of a chemical reaction involving its precursors: reactive organic gases (ROG) and nitrogen oxides (NOx). The proposed project would lead to an increase in the amount of ozone precursors and, therefore, add to the difficulty in attaining the ozone standard.

Regional Emission Estimates. Because the project site is currently undeveloped, ROG and NOx emissions attributable to existing levels of development are considered to be negligible. Table G-3 lists the sources of emissions that contribute to ozone problems in San Joaquin County. The data shown in Table G-3 include estimates of current year emissions and projections of future year emissions. The data are disaggregated by emission source category.

Carbon Monoxide Concentrations

Methodology. The CO air quality analysis performed on the EIR used the CALINE3 computer model. CALINE3 is a line source air quality model developed by the California Department of Transportation to analyze localized air quality impacts (Benson 1979). For a description of CALINE3 and how it was used in this EIR, see Appendix J.

The air quality analysis prepared for this EIR focused on the potential for localized CO problems near heavily traveled congested intersections. CO concentrations were estimated at the following intersections:

- Interstate 5 and March Lane
- Feather River and March Lane
- Quail Lakes Drive and March Lane
- Pershing Avenue and March Lane
- Pacific Avenue and March Lane

Table G-3

Emissions Projections for San Joaquin County in Tons Per Day and Percent of Total

Source Category	Reactive Organic Compounds								Nitrogen Oxides								Particulate Matter							
	1988		1990		1995		2000		1988		1990		1995		2000		1988		1990		1995		2000	
	tn/dy	percent	tn/dy	percent	tn/dy	percent	tn/dy	percent	tn/dy	percent	tn/dy	percent	tn/dy	percent	tn/dy	percent	tn/dy	percent	tn/dy	percent	tn/dy	percent	tn/dy	percent
Fuel Combustion	0.40	0.60%	0.40	0.61%	0.40	0.59%	0.50	0.70%	12.00	22.26%	12.30	22.91%	13.10	24.35%	13.80	24.60%	0.70	0.47%	0.70	0.45%	0.80	0.46%	0.80	0.42%
Agricultural Waste Burning	2.10	3.16%	2.10	3.19%	2.30	3.41%	2.40	3.34%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	3.80	2.56%	3.80	2.44%	4.10	2.35%	4.30	2.25%
Other Waste Burning	0.20	0.30%	0.30	0.46%	0.20	0.30%	0.30	0.42%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.70	0.47%	0.70	0.45%	0.80	0.46%	0.90	0.47%
Solvent Use	14.50	21.84%	15.10	22.95%	17.10	25.33%	19.10	26.56%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Petroleum Process, Storage and Transfer	2.90	4.37%	2.90	4.41%	2.90	4.30%	2.80	3.89%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Industrial Processes	1.50	2.26%	1.60	2.43%	1.90	2.81%	2.20	3.06%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	4.10	2.76%	4.20	2.70%	4.50	2.58%	4.80	2.51%
Pesticide Application	16.70	25.15%	17.40	26.44%	19.40	28.74%	21.30	29.62%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Farming Operations	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	32.90	22.15%	33.20	21.35%	35.10	20.16%	37.10	19.37%
Construction & Demolition	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	21.40	14.41%	22.40	14.41%	25.50	14.65%	28.70	14.99%
Entrained Road Dust From Paved Sources	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	70.30	47.34%	75.60	48.62%	87.80	50.43%	98.50	51.44%
Entrained Road Dust From Unpaved Sources	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	8.30	5.59%	8.40	5.40%	8.90	5.11%	9.50	4.96%
Unplanned Fires	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.10	0.07%	0.10	0.06%	0.10	0.06%	0.10	0.05%
SUBTOTAL FOR STATIONARY SOURCES	38.30	57.68%	39.80	60.49%	44.20	65.48%	48.60	67.59%	12.00	22.26%	12.30	22.91%	13.10	24.35%	13.80	24.60%	142.30	95.82%	149.10	95.88%	167.60	96.27%	184.70	96.45%
On-Road Vehicles	18.30	27.56%	15.70	23.86%	11.90	17.63%	10.90	15.16%	31.20	57.88%	30.50	56.80%	29.20	54.28%	30.10	53.65%	5.00	3.37%	5.10	3.28%	5.10	2.93%	5.30	2.77%
Off-Road Vehicles	6.30	9.49%	6.70	10.18%	7.60	11.26%	8.50	11.82%	1.20	2.23%	1.30	2.42%	1.50	2.79%	1.70	3.03%	0.00	0.00%	0.00	0.00%	0.10	0.06%	0.10	0.05%
Aircraft	0.50	0.75%	0.50	0.76%	0.50	0.74%	0.60	0.83%	0.20	0.37%	0.20	0.37%	0.20	0.37%	0.20	0.36%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Other Mobile Sources	3.00	4.52%	3.10	4.71%	3.30	4.89%	3.30	4.59%	9.30	17.25%	9.40	17.50%	9.80	18.22%	10.30	18.36%	1.20	0.81%	1.30	0.84%	1.30	0.75%	1.40	0.73%
SUBTOTAL FOR MOBILE SOURCES	28.10	42.32%	26.00	39.51%	23.30	34.52%	23.30	32.41%	41.90	77.74%	41.40	77.09%	40.70	75.65%	42.30	75.40%	6.20	4.18%	6.40	4.12%	6.50	3.73%	6.80	3.55%
GRAND TOTAL FOR ALL SOURCES	66.40	100.00%	65.80	100.00%	67.50	100.00%	71.90	100.00%	53.90	100.00%	53.70	100.00%	53.80	100.00%	56.10	100.00%	148.50	100.00%	155.50	100.00%	174.10	100.00%	191.50	100.00%

Source: Air Resources Board, base year 1988 Emissions Data System and Forecasting System

Selection was based on a screening procedure of all the intersections studied in Section F, "Transportation." These intersections were selected because they had a combination of high volumes and congestion and were considered locations where potential violations of CO standards could occur.

The CALINE3 air quality analysis estimated CO concentrations at "receptors." Receptors are specific geographic points representing locations where people would be exposed to CO. For each receptor, CALINE3 estimates the total of CO contributions from a network of roadway segments. Receptors are typically residences or places of work near congested intersections where people would be exposed to vehicle-generated CO for extended periods.

In this EIR, the receptor locations were determined by examining recent (1986) aerial photographs. The buildings closest to a congested intersection were selected as receptor locations. Where there were no buildings in the vicinity of congested intersections, receptor points were located 50 feet from the edge of the roadways. A setback of 50 feet is considered to be an average distance for buildings located along arterials. The roadway network and receptor locations used in this analysis are shown in Figure G-1.

The air quality analyses used p.m. peak-hour traffic data described in Section F, "Transportation." Existing, Existing Plus Approved Projects Without the Proposed Project, Existing Plus Approved Projects With the Proposed Project, Cumulative Without the Proposed Project, and Cumulative with the Proposed Project traffic conditions were modeled.

Localized CO Estimates. Table G-4 shows estimated existing CO concentrations in the vicinity of intersections listed above. Eleven of the receptor locations show a potential violation of the state or federal 8-hour CO standard of 9 ppm. In addition, two of the receptor locations show a potential for violation of the state 1-hour standard of 20 ppm or the federal 1-hour standard of 35 ppm.

The highest estimated worst-case 8-hour average value under existing traffic conditions is 13.0 ppm at the intersection of Quail Lakes Drive and March Lane. The highest predicted worst-case peak-hour average value under this traffic condition is 21.6 ppm at the same location.

Project Impacts and Mitigation Measures

Definition of Significance

In this section, the potential air quality impacts from the proposed project are discussed. According to the State CEQA Guidelines (Section 15064[e] and Appendix G), a project will normally have a significant adverse impact if it will "violate any ambient air quality standard, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations."

The project's potential for violating the ambient air quality standards for CO is used in this EIR to determine the significance of localized air

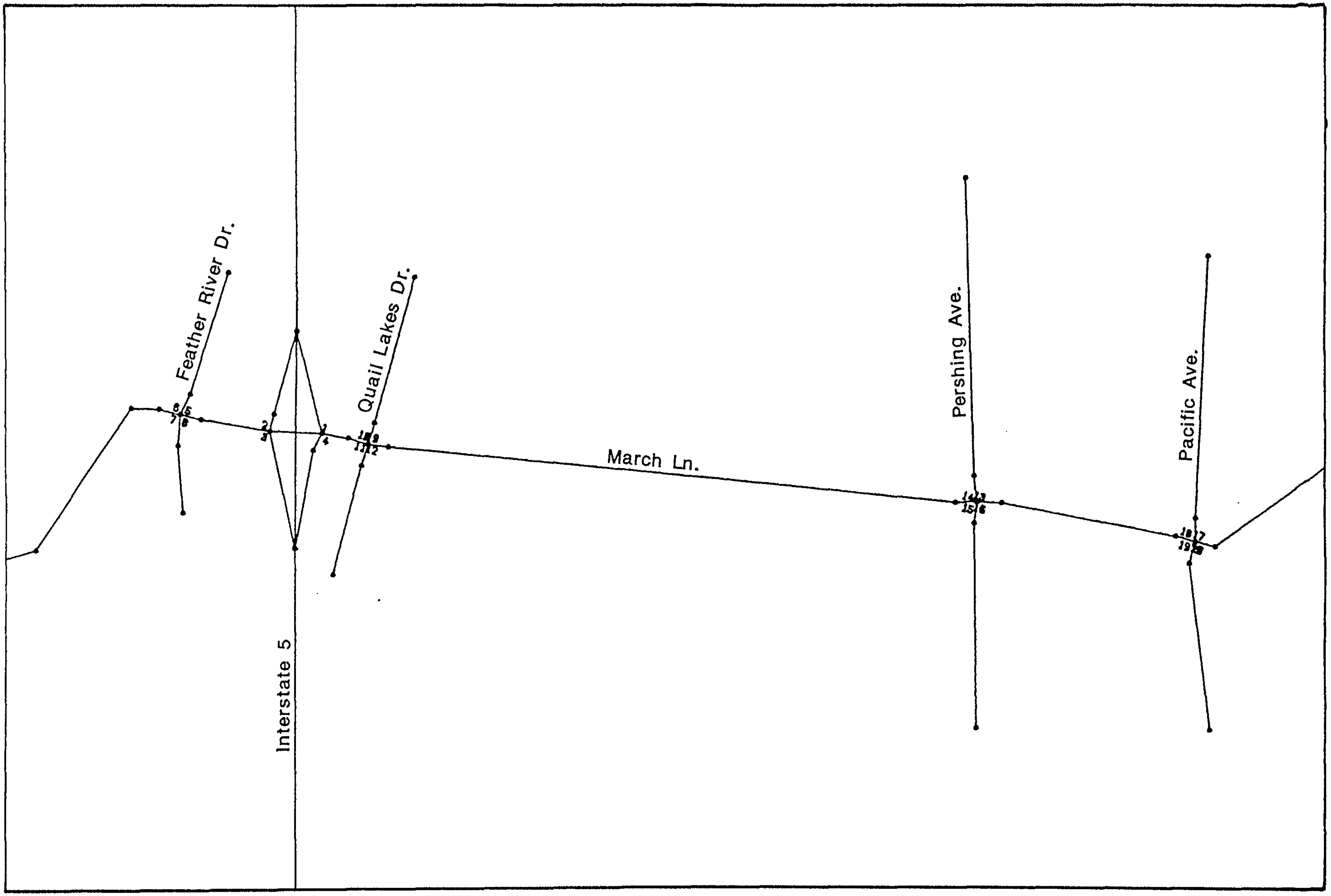

FIGURE G-1. ROADWAY NETWORK AND RECEPTORS USED IN CARBON MONOXIDE AIR QUALITY ANALYSIS

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Table G-4. Predicted Worst-Case Carbon Monoxide Levels in Parts Per Million

Intersection	Receptor Location	Existing Traffic Conditions		Existing Plus Approved Projects Traffic Conditions Without Proposed Project		Existing Plus Approved Projects Traffic Conditions With Proposed Project		Cumulative Traffic Conditions Without Proposed Project		Cumulative Traffic Conditions With Proposed Project	
		Peak Hour Average	8-Hour Average	Peak Hour Average	8-Hour Average	Peak Hour Average	8-Hour Average	Peak Hour Average	8-Hour Average	Peak Hour Average	8-Hour Average
Interstate 5 / March Lane	Northeast corner	15.2	9.1 *	13.6	8.2	22.7 *	13.6 *	10.9	6.5	16.0	9.6 *
	Northwest corner	13.8	8.3	12.8	7.7	23.9 *	14.3 *	10.5	6.3	15.4	9.2 *
	Southwest corner	12.7	7.6	12.8	7.2	24.2 *	14.5 *	10.6	6.4	15.8	9.5 *
	Southeast corner	16.1	9.7 *	14.7	8.8	22.9 *	13.7 *	10.1	6.1	15.1	9.1 *
Feather River / March Lane	Northeast corner	9.1	5.5	8.6	5.2	19.3	11.6 *	7.2	4.3	12.9	7.7
	Northwest corner	9.1	5.5	8.7	5.2	19.9	11.9 *	6.8	4.1	13.3	8.0
	Southwest corner	10.3	6.2	10.0	6.0	24.4 *	14.6 *	7.6	4.6	16.1	9.7 *
	Southeast corner	10.1	6.1	9.6	5.8	22.3 *	13.4 *	7.6	4.6	14.7	8.8
Quail Lakes Drive / March Lane	Northeast corner	16.9	10.1 *	15.4	9.2	23.2 *	13.9 *	11.0	6.6	15.4	9.2 *
	Northwest corner	14.9	8.9	13.5	8.1	23.4 *	14.0 *	9.5	5.7	15.1	9.1 *
	Southwest corner	20.5 *	12.3 *	17.9	10.7 *	25.8 *	15.8 *	13.3	8.0	17.5	10.5 *
	Southeast corner	21.6 *	13.0 *	18.7	11.2 *	25.3 *	15.2 *	12.9	7.7	17.4	10.4 *
Pershing Avenue / March Lane	Northeast corner	17.0	10.2 *	15.9	9.5 *	24.2 *	14.5 *	12.2	7.3	15.1	9.1 *
	Northwest corner	17.8	10.7 *	16.9	10.1 *	22.5 *	13.5 *	12.4	7.4	14.6	8.8
	Southwest corner	13.4	8.0	12.7	7.6	17.8	10.7 *	10.0	6.0	12.3	7.4
	Southeast corner	18.2	10.9 *	16.7	10.0 *	25.5 *	15.3 *	12.1	7.3	16.3	9.8 *
Pacific Avenue / March Lane	Northeast corner	16.2	9.7 *	15.2	9.1 *	25.1 *	15.1 *	12.7	7.6	15.6	9.4 *
	Northwest corner	12.8	7.7	12.7	7.6	19.5	11.7 *	10.3	6.2	11.8	7.1
	Southwest corner	15.1	9.1 *	14.9	8.9	18.6	11.2 *	12.4	7.4	13.6	8.2
	Southeast corner	17.8	10.7 *	16.6	10.0 *	25.9 *	15.5 *	13.6	8.2	15.6	9.4 *

Notes:
- Federal and state 8-hour standards for CO = 9 parts per million (ppm)
- Federal 1-hour standards for CO = 35 ppm.
- State 1-hour standard for CO = 20 ppm.
- Results based on CALINE3 dispersion model and EMFAC7pc emissions model.
- 8-hour average values = 0.6 x peak 1-hour average values based on relationship between peak-hour and 8-hour CO concentrations in San Joaquin County monitoring data.
- CO concentrations include a "background" CO of 4.2 ppm for 1-hour average and 2.5 ppm for 8-hour average for existing conditions.
- Future conditions include "background" CO concentrations of 2.3 ppm for 1-hour averages and 1.4 ppm for 8-hour averages.
- Inspection & maintenance (I & M) credits were not assumed for existing conditions. A 16.8 percent I & M credit was applied to composite emission rates for existing plus approved projects conditions. A 25 percent I & M credit was applied to composite emission rates for cumulative conditions.
- For description of other assumptions and methodology, see the technical air quality appendix.

* Indicates a potential for exceedance of federal and/or state standard.

quality impacts. In assessing the significance of regional air quality impacts, this EIR uses thresholds applied by the San Joaquin County Air Pollution Control District in its new source review (NSR) program.

Short-Term Impacts

Construction-related short-term air quality impacts would occur from equipment and vehicle exhaust emissions, paving activity, and dust generated by construction vehicles and equipment. Exhaust emissions from vehicles and equipment are normally small in quantity and short in duration. Paving activity generates small amounts of hydrocarbons, particulate matter, and odors.

Impact: Emission Of Dust Particles Caused By Project Construction

Construction of the project would cause an indeterminable quantity of dust particles to be emitted into the atmosphere as a result of wind erosion over exposed earth surfaces and activity by construction vehicles and equipment. Dust generation is dependent on soil type and soil moisture. A major fraction of these dust particles would settle out on and immediately adjacent to the project site, while a minor fraction would contribute to the area's ambient particulate level. In general, particles larger than 30 microns (effective aerodynamic diameter) would settle out within a short distance of the project site. Dust generated from project construction would be a potential nuisance to neighboring land owners and a significant adverse impact. This impact could be mitigated to a less-than-significant level by implementing the following measure.

Mitigation Measure

- o Use standard construction practices to reduce the amount of dust particles emitted due to construction activities, including minimizing the amount of time surfaces are left exposed, periodic sprinkling of exposed areas and soil piles with water, covering soil piles with plastic sheets or tarpaulins to limit disturbance, limiting vehicle speeds on exposed surfaces, and grading roadway segments in succession to minimize the amount of time that surfaces are left exposed.

Impact: Generation Of Air Pollutants By Construction Equipment. Construction equipment powered by internal combustion engines would emit an indeterminable quantity of NOx, hydrocarbons, particulates, sulfur dioxides, and CO. These emissions would represent a significant adverse impact, but this impact could be mitigated to a less-than-significant level by implementing the following measure.

Mitigation Measure

- o The developer should use properly maintained construction equipment to minimize emissions from internal combustion engines.

Long-Term Impacts

Impact: Degradation of Regional Air Quality

Regional Emissions Standards. The estimates of NOx and ROG emissions resulting from the project were made using the URBEMIS #2 program developed by the California Air Resources Board (California Air Resources Board 1987). URBEMIS #2 is a program that estimates the emissions resulting from various land use development projects. For a description of URBEMIS #2 and how it was used in this analysis, see Appendix J. These emissions estimates are for mobile sources only but are considered to represent the majority of emissions attributable to the project.

San Joaquin County Air Pollution Control District (APCD) NSR program thresholds were used to assess the significance of regional air quality impacts. In general, an NSR program sets requirements for minimizing or compensating for emissions from new stationary sources or modification of existing stationary sources. When a new or modified stationary source is proposed in San Joaquin County, an estimate of its emissions is compared with a set of threshold levels. If the estimated emissions are above 150 pounds per day, use of Best Available Control Technology (BACT) for emissions reduction is required. If the estimated emissions are above 250 pounds per day, offsets are required. Under offset requirements, a project proponent is required to achieve a reduction in emissions elsewhere to offset the impact of the project.

If the amount of emissions for either ROG or NOx that would result from the project is less than the BACT thresholds of 150 pounds per day, that regional air quality impact is considered to be less than significant. If the amount of resulting emissions from either ROG or NOx is greater than the offsets threshold of 250 pounds per day, that impact is considered to be significant. If the amount of emissions from either ROG or NOx that would result from the project is between 150 and 250 pounds per day, that impact is considered to be potentially significant.

Emissions Generated by the Project. Regional emissions from the project were estimated for both 1990 and 2010, representing the earliest and latest year by which project buildout has been projected. The year of project buildout is relevant to air quality estimates, because it is assumed that the future vehicle fleet will be more efficient and emit less pollutants than the current vehicle fleet. Future year on-road vehicle emissions will therefore be less than current year emissions, all other input variables remaining constant.

The project would result in ROG and NOx emissions of 525.5 and 821.5 pounds per day, respectively, in 1990 or 273.5 and 643.2 pounds per day, respectively, in 2010 (Table G-5). The project would result in ROG and NOx emissions greater than 250 pounds per day in 1990 and 2010. San Joaquin County is already a nonattainment area with respect to ozone. Any additions to regional vehicle trips would compound the regional ozone problem. The project's contribution to regional air quality problems would represent a significant and unavoidable adverse impact, since no measures that could mitigate this impact to a less-than-significant level are available.

Table G-5. Predicted On-Road Mobile Emissions at Different Years for the Proposed Project and Various Project Alternatives

Alternative	1990		2010	
	Reactive Organic Gas (pounds per day)	Nitrogen Oxide (pounds per day)	Reactive Organic Gas (pounds per day)	Nitrogen Oxide (pounds per day)
Proposed Project	525.5	821.5	273.5	643.2
No Project	0	0	0	0
Partial Project	391.7	615.2	203.8	481.5
Highest Housing Density	938.7	1,441.2	987.7	1,128.4
Mitigated Project	520.3	813.9	270.8	637.3

Notes: Based on URBEMIS #2 emissions analysis model (California Air Resources Board 1987).

Assumes 92 percent of total organic gases are reactive.

Assumes 12.3 percent motor vehicle inspection and maintenance credit for reactive organic gas (California Legislature 1987).

Mitigation Measures

- o No adequate measures are available. However, the following measures would partially mitigate this impact. Measures that reduce the number of regional trips would help reduce regional air quality impacts. These measures include additional park and ride lots, ridesharing programs, and expanded public transit service.

- o The applicant will contribute a pro rata share of the costs in accordance with an air quality impact fee ordinance as may be adopted by the City to fund TSM improvements.

Impact: Localized CO Concentrations

CALINE3 was used in estimating the impacts of the proposed project. Descriptions of the model and modeling assumptions that were used are included in Appendix J of this EIR. Table G-4 shows the full results of the air quality analysis. Two conditions will be summarized in this section: Existing Plus Approved Development Without Project and Existing Plus Approved Development With Project. The difference in CO concentration estimates represents the project's impact. The CO estimates under these conditions are slightly lower due to an assumption that inspection and maintenance programs will be in effect. Currently, under Existing Conditions no I & M credit is given to the vehicle emission estimates because the I & M program was just recently implemented in San Joaquin County (See Appendix J for further discussion).

Under the Existing Plus Approved Development Without Project scenario, traffic conditions indicate potential violations of the state or federal 8-hour CO standard of 9 ppm at seven receptor locations. None of the receptor locations shows potential violations of the 20-ppm state 1-hour standard or the 35-ppm federal 1-hour standard. The highest predicted worst-case 8-hour average value under this traffic condition is 11.2 ppm at the intersection of Quail Lakes Drive and March Lane. The highest predicted worst-case 1-hour average value under this traffic condition is 18.7 ppm at the same location.

Under the Existing Plus Approved Development With Project scenario, traffic conditions indicate potential violations of the state or federal 8-hour CO standard of 9 ppm at 20 of the receptor locations. Potential violations of the 20-ppm state 1-hour standard or the 35-ppm federal 1-hour standard are also indicated at seven of the receptor locations. The highest predicted worst-case 8-hour average value under this traffic condition is 15.5 ppm at the intersection of Pacific Avenue and March Lane. The highest predicted worst-case 1-hour average value under this traffic condition is 25.9 ppm at the same location.

Since localized CO concentrations could exceed state standards, this impact is considered to be significant. This impact could not be mitigated to a less-than-significant level. However, the impact could be partially mitigated by implementing the following measures.

Mitigation Measures

- o Implement transportation system improvements as recommended in Section F.
- o Implement trip reduction measures such as provision of transit, ridesharing programs, and incentives to use other alternate modes of transportation.

Cumulative Impacts and Mitigation Measures

CO estimates are lower under cumulative conditions than under any of the other conditions analyzed due to three factors: 1) transportation facility improvements included in the traffic modeling that provide for better overall circulation and less congestion in the Stockton area, 2) an assumption in the emissions model that future year emission rates will be lower than current year emission rates, and 3) a standard air quality modeling assumption that inspection and maintenance programs will be more effective in future years than in current years, resulting in even lower emission rate assumptions.

Impact: Localized CO Concentrations

Emission level projections under the Cumulative Traffic Conditions Without Proposed Project and Cumulative Traffic Conditions With Proposed Project scenarios are shown in Table G-4.

Under the Cumulative Traffic Conditions Without Proposed Project scenario, no potential violations of the 9-ppm state or federal 8-hour CO standard, the 20-ppm state 1-hour standard, or the 35-ppm federal 1-hour standard are indicated at receptor locations. CO impacts are therefore considered to be less than significant. The highest predicted worst-case 8-hour average value under this traffic condition is 8.2 ppm at the intersection of Pacific Avenue and March Lane. The highest predicted worst-case 1-hour average value under this traffic condition is 13.6 ppm at the same location.

Under the Cumulative Traffic Conditions With the Proposed Project scenario, traffic conditions indicate potential violations of the 9-ppm state or federal 8-hour CO standard at 13 receptor locations. Potential violations of the 20-ppm state 1-hour standard or the 35-ppm federal 1-hour standard are indicated at none of the receptor locations. The highest predicted worst-case 8-hour average value under this traffic condition is 10.5 ppm at the intersection of Quail Lakes Drive and March Lane. The highest predicted worst-case 1-hour average value under this traffic condition is 17.5 ppm at the same location.

Since localized CO concentrations could exceed state standards, this impact is considered to be significant. This impact could not be mitigated to a less-than-significant level. However, the impact could be partially mitigated by implementing the following measures.

Mitigation Measures

- o Implement transportation system improvements as recommended in Section F.
- o Implement trip reduction measures such as provision of transit, ridesharing programs, and incentives to use other alternate modes of transportation.

Project Alternatives

Regional air quality effects of three project alternatives were also analyzed (Table G-5). Alternatives to the project are generally described and evaluted in Section P.